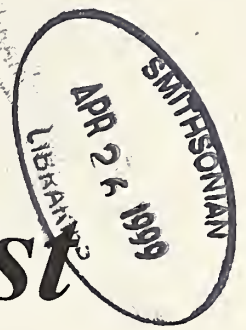


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# *Maryland Naturalist*

The Natural History Society of Maryland



Volume 42, Number 3-4

July/December 1998

# The Maryland Naturalist

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Arnold W. Norden and Donnell E. Redman, Editors

**Mailing Date: April 10, 1999**

Cover Illustration: Scanning electron micrograph of the tongue of a male mason bee, *Anthophora abrupta* Raw. The numerous feather-like structures along the shaft are sensory detectors that probably function as pheromone collectors. SEM image prepared by Dr. Beth Norden and Ms. Susann Braden of the National Museum of Natural History, Smithsonian Institution, Washington, D.C. This specimen was taken from a large colony that nested in an adobe chicken shed on the farm of Jean and Elmer Worthley in Owings Mills, Maryland. Mason bees are valuable natural pollinators.



## Introduced Plant Species in Maryland

Simon Dabydeen and Jeffrey A. Levi

**ABSTRACT.**- The vascular flora of Maryland is comprised of 2720 species (native and non-native) representing 851 genera and 174 families. Introduced woody species are represented by 166 species in 80 genera of 41 families, while introduced herbaceous species are represented by 513 species in 280 genera of 54 families. Introduced species (679) constitute 24.9 percent of the vascular flora of Maryland. The main places of origin of these exotic species are Europe 57.6% (391 spp.), Asia/Eurasia 20.8% (141 spp.), US (other states) 10.0% (68 spp.), Japan 3.7% (25 spp.) and Tropical/South America 4.1% (28 spp.).

No comprehensive checklist of introduced plant species in Maryland has been compiled. This paper attempts to fulfill the need for such a list.

Historically, the rate of introduction of plant species between and among the various phytogeographic regions of the world was low, so that the floristic composition of these regions remained relatively stable over long periods of time. A low rate of introduction generally occurred through dispersal of propagules by animals, wind, and water. However, with the advent of an exploding and increasingly more mobile human population the rate of introduction accelerated tremendously resulting in many instances of sudden profound floristic transformation. The literature on introduced species (both floral and faunal), and their impact on native biota is voluminous (Drake et al. 1989, Grove and Burdon 1986, Hedgpeth 1993, Raesly 1993).

Non-native plant species are often introduced accidentally, but the main reasons for deliberate introductions are agricultural, medicinal, and horticultural purposes. Large numbers of foreign plant species have been introduced into the United States and many native US species have been introduced among states, yet little information on numerical assessments of non-native plant species within each state is available. In California, the flora includes 674 introduced species (Raven and Axelrod 1978), and in Southern Florida, the number of exotics is about 300 (Ewel 1986). In the Hawaiian Islands, approximately 4600 non-native plant species have been recorded (St. John 1973).

Information on species introduced into Maryland was obtained from Brown and Brown (1972, 1984), Cooley (1994), Coombes (1992), Fernald (1970), Kartesz (1994), Small (1933), Strasbaugh and Core (1964), popular horticultural publications, landscaping companies, local botanists and naturalists. We recognize that since species are being introduced continuously, not all introduced species are listed here, but we believe that the majority of Maryland's exotics have been identified in this survey.

In Maryland, the vascular flora including native and non-native species, comprises 2720 species representing 851 genera and 174 families. The woody plants are represented by 59 families, 136 genera and 465 species, while the herbaceous plants are represented by 115 families, 715 genera and 2255 species (Brown and Brown 1972, 1984). Introduced woody plants represent 41 families, 80 genera, and 166 species, while introduced herbaceous plants represent 54 families, 280 genera and 513 species. Introduced plants represent 95 families, 360 genera and 679 species in the total flora of Maryland. Numbers and percentages of these taxa are given (Table 1).

Larger numbers of introduced woody species belong to five families: Rosaceae (26), Pinaceae (19); Salicaceae (11), Oleaceae (9), and Saxifragaceae (9). Two woody families (Ginkgoaceae, Loganiaceae) not listed in Brown and Brown (1972), are each represented by a single species. Herbaceous families with larger numbers of introduced species are Asteraceae (92), Poaceae (65), Brassicaceae (40), Fabaceae (32), Lamiaceae (25), Caryophyllaceae (23), Apiaceae (18), Polygonaceae (18), Scrophulariaceae (17), and Liliaceae (15). Of the introduced woody plants, 64 species originated in Asia/Eurasia, 45 species in Europe, 30 species elsewhere in the US, and 20 species in Japan. Of the introduced herbaceous plants, 346 species originated in Europe, 77 species in Asia/Eurasia, 38 species elsewhere in the US, 28 in Tropical/South America, and 5 species in Japan (Table 2).

Table 1. Number and percentages of plant taxa.

	<u>Family</u>		<u>Genera</u>		<u>Species</u>	
	#	%	#	%	#	%
A. <u>MD - Flora</u>						
Woody	59	(33.9)	136	(15.9)	465	(17)
Herbaceous	115	(66.1)	715	(84.1)	2255	(83)
Total MD - Flora	174	(100)	851	(100)	2720	(100)
B. <u>Introduced</u>						
Woody	41	(69.5)	80	(58.8)	166	(35.7)
Herbaceous	54	(47.0)	280	(39.2)	513	(22.7)
Total Introduced	95	(54.6)	360	(42.3)	679	(24.9)

A. Percentages represent the number of the total Maryland flora for each category.

B. Percentages represent the number of introduced taxa of the total Maryland flora for each category.

Table 2. Number and percentages\* of introduced species according to place of origin.

	<u>Europe</u>		<u>Asia/Eurasia</u>		<u>US(other states)</u>		<u>Japan</u>		<u>Trop./South Am.</u>	
	#	%	#	%	#	%	#	%	#	%
Woody	45	(27.1)	64	(38.5)	30	(18.1)	20	(12.0)	0	(0.0)
Herbaceous	346	(67.4)	77	(15.0)	38	(7.4)	5	(1.0)	28	(5.5)
Total	391	(57.6)	141	(20.8)	68	(10.0)	25	(3.7)	28	(4.1)

\* Percentages represent the number of species of that category out of the total number of species from that category.

### Species Lists

The places of origin for the plants on the following lists are abbreviated as follows: Arg. = Argentina; Circ. = Circumboreal; Chi. = China; Eur. = Europe; Eura. = Eurasia; Ind. = India; Jap. = Japan; Med. = Mediterranean; Mex. = Mexico; N/A. = Not Available; Nor. = Norway; NW. = New World; SAm. = South America; TAm. = Tropical America; US. = United States of America (other than Maryland); Russ. = Russia.

### Introduced Woody Plants

#### ACERACEAE

*Acer ginnala* Maxim.  
N/A Asia.  
*A. japonicum* Thunb.  
Fullmoon Maple Jap.  
*A. platanoides* L.  
Norway Maple Eur.  
*A. pseudo-platanus* L.

Sycamore Maple Eur.

#### BAMBUSACEAE

*Phyllostachys aurea* Riv.  
Bamboo Asia.  
*P. aureosulcata* McClure  
Yellow Grove Bamboo Asia.  
*P. bambusoides* Sieb. & Zucc.  
Fishing Pole Bamboo Asia

*Pseudosasa japonica*  
(Sieb. & Zucc.) Makino  
False Sasa Asia.  
*Sasa palmata* (Bean) Camus  
Palm Bamboo Asia.  
*S. veitchii* (Carriere) Rehder  
Kuma Bamboo Asia.

**BERBERIDACEAE**  
*Berberis thunbergii* DC.  
Japanese Barberry Jap.  
*B. vulgaris* L.  
Common Barberry Eur.

**BETULACEAE**  
*Betula alba* L.  
European White Birch Eur.

**BIGNONIACEAE**  
*Catalpa bignonioides* Walt.  
Southern Catalpa US.  
*C. ovata* G. Don.  
Chinese Catalpa Chi.  
*C. speciosa* Warder  
Cigartree/ Catalpa US.

**BUXACEAE**  
*Buxus sempervirens* L.  
Boxwood Eur.  
*Pachysandra procumbens* Michx.  
Allegheny Spurge US.  
*P. terminalis* Sieb. & Zucc.  
N/A Asia.

**CAESALPINIACEAE**  
*Gleditsia triacanthos* L.  
Honeylocust US.  
*Gymnocladus dioica* (L.) Koch.  
Kentucky Coffeetree US.

**CALYCANTHACEAE**  
*Calycanthus floridus* L.  
Carolina Allspice US.

**CAPRIFOLIACEAE**  
*Lonicera x bella* Zabel  
Honeysuckle Eura.  
*L. fragrantissima* L.  
Fragrant Honeysuckle Asia.  
*L. japonica* Thunb.  
Japanese Honeysuckle Asia.  
*L. morrowii* Gray  
Morrow's Honeysuckle Eura.  
*L. standishii* Jacques  
Honeysuckle Asia.  
*L. tatarica* L.  
Tartarian Honeysuckle Eura.  
*Viburnum plicatum* Thunb.  
Shasta Viburnum Asia.  
*V. trilobum* Marsh  
Highbush Cranberry US.

**CELASTRACEAE**  
*Celastrus orbiculatus* Thunb.  
Round Staff-Tree Asia.  
*Euonymus alatus* (Thunb.) Sieb.  
Winged Spindle-Tree Asia.  
*E. fortunei* (Turcz.) Hand.-Maz.  
Winter Creeper Asia.

**ELAEAGNACEAE**  
*Elaeagnus angustifolia* L.  
Oleaster or Russian Olive Eura.  
*E. umbellata* Thunb.  
Oleaster Asia.

**FABACEAE**  
*Cytisus scoparius* (L.) Link  
Scotch Broom US.  
*Laburnum anagyroides* Medik.  
Golden Chain N/A.  
*Sophora japonica* L.  
Japanese Pagoda Tree Jap.  
*Wisteria floribunda* (Willd.) DC.  
Japanese Wisteria Asia.  
*W. frutescens* (L.) Poir.  
N/A US.  
*W. sinensis* (Sims.) Sweet  
Chinese Wisteria Chi.

**FAGACEAE**  
*Castanea mollissima* Bl.  
Chinese Chestnut Asia.  
*C. sativa* Mill.  
Sweet Chestnut Eura.  
*Fagus sylvatica* L.  
European Beech Eur.  
*Quercus acutissima* Carruthers  
Sawtooth Oak Asia.

**GINKGOACEAE**  
*Ginkgo biloba* L.  
Maidenhair Tree Chi.

**HIPPOCASTANACEAE**  
*Aesculus hippocastanum* L.  
Horse Chestnut US.  
*A. octandra* Marsh.  
Sweet Buckeye US.

**JUGLANDACEAE**  
*Carya illinoensis* (Wang.) K. Koch  
Pecan US.  
*C. laciniosa* (Michx.) Loud.  
Kingnut US.  
*Juglans regia* L.  
English Walnut Eur.

**LARDIZABALACEAE**  
*Akebia quinata* (Houtt.) Decne.  
N/A Asia.

**LOGANIACEAE**  
*Buddleja davidii* Franch.



Butterfly Bush Asia.  
 MAGNOLIACEAE  
*Magnolia macrophylla* Michx.  
 Great-Leaved Magnolia US.  
*M. soulangeana* Soul.  
 Saucer Magnolia Asia.  
*M. stellata* Maxim.  
 Star Magnolia Asia.

MALVACEAE  
*Hibiscus syriacus* L.  
 Rose-of-Sharon Asia.

MIMOSACEAE  
*Albizia julibrissin* Durazz.  
 Mimosa/Silk tree Asia.

MORACEAE  
*Broussonetia papyifera* (L.) Vent.  
 Paper Mulberry Asia.  
*Ficus carica* L.  
 Fig Eur.  
*Maclura pomifera* (Raf.) Schneid.  
 Osage Orange US.  
*Morus alba* L.  
 White Mulberry Asia.

OLEACEAE  
*Forsythia intermedia* Zab.  
 Forsythia N/A.  
*Ligustrum amurense* Garr.  
 Amur Privet Eur.  
*L. japonicum* Thunb.  
 N/A. Jap.  
*L. lucidum* Ait.  
 Glossy Privet Eur.  
*L. obtusifolium* Sieb. & Zucc.  
 N/A. Jap.  
*L. ovalifolium* Hassk.  
 California Privet Jap.  
*L. vulgare* L.  
 Privet Eur.  
*Syringa reticulata* (Blume) Hara  
 Japanese Tree Lilac Jap.  
*S. vulgaris* L.  
 Lilac Eur.

PINACEAE  
*Abies concolor* Lidl. & Gord.  
 White Fir US.  
*A. fraseri* (Pursh) Poir.  
 Fraser-Fir US.  
*A. grandis* Lindl.  
 Lowland White Fir US.  
*A. balsamea* Mill.  
 Balsam Fir US.  
*A. veitchii* Lindl.  
 N/A Jap.  
*A. normanniana* (Stev.) Spach

Caucasian Fir Russ.  
*Cedrus atlantica* Man.  
 Atlas Cedar Eur.  
*C. deodora* G. Don  
 Deodar Asia.  
*Cryptomeria japonica* D. Don  
 Japanese Cedar Jap.  
*Larix decidua* P. Mill  
 European Larch Eur.  
*L. leptolepis* Sieb & Zucc.  
 Japanese Larch Jap.  
*Metasequoia glyptostroboides* Hu & Cheng  
 Dawn Redwood Chi.  
*Picea abies* (L.) Karst  
 Norway Spruce Nor.  
*Pinus nigra* Arnold  
 Austrian Pine Eur.  
*P. resinosa* Ait.  
 Red Pine US.  
*P. sylvestris* L.  
 Scotch Pine Eur.  
*P. thunbergii* Parl.  
 Japanese Black Pine Asia.  
*Pseudotsuga menziesii* (Mirb.) Franco  
 Douglas Fir US.  
*Thuja occidentalis* L.  
 Northern White Cedar US.

PLATANACEAE  
*Platanus orientalis* L.  
 Sycamore Asia.  
*P. x acerifolia* Willd.  
 London Plane US.

RANUNCULACEAE  
*Clematis dioscoreifolia* Levl. & Vaniot.  
 Clematis Jap.

RHAMNACEAE  
*Crataegus phaenopyrum* L. f.  
 Washington Thorn US.  
*Rhamnus cathartica* L.  
 Common Buckthorn Eura.  
*R. frangula* L.  
 European Buckthorn Eura.

ROSACEAE  
*Prunus armeniaca* L.  
 Apricot Asia.  
*P. avium* L.  
 Sweet, Bird Cherry Eura.  
*P. cerasus* L.  
 Sour, Pie Cherry Asia.  
*P. mahaleb* L.  
 Perfumed Cherry Eura.  
*P. padus* L.  
 Bird Cherry Eura.  
*P. persica* (L.) Batsch

Peach Asia.  
*P. sargentii* Rehd.  
     Sargent Cherry Jap.  
*P. x subhirtella* Miq.  
     Spring Cherry Jap.  
*P. x yedoensis* Matsumura  
     Yoshino Cherry Jap.  
*Pyrus acuparia* (L.) Gaetrn.  
     Rowan Tree/European Mt. Ash Eur.  
*P. communis* L.  
     Common Pear Eura.  
*P. malus* L.  
     Apple Eura.  
*Rhodotypos scandens* (Thunb.) Makino  
     N/A Asia.  
*Rosa canina* L.  
     Dog Rose Eur.  
*R. centifolia* L.  
     Cabbage Rose Russ.  
*R. gallica* L.  
     French Rose Eur.  
*R. eglanteria* L.  
     Sweet-Briar/Eglantine Eur.  
*R. multiflora* Thunb.  
     Multiflora Rose Asia.  
*R. wichuraiana* Crepin  
     Memorial Rose Asia.  
*Rubus bifrons* Vest  
     Blackberry Eur.  
*R. illecebrosus* Focke  
     Stawberry-Raspberry Jap.  
*R. laciniatus* Willd.  
     Cut-Leaved Blackberry Eur.  
*R. phoenicolasius* Maxim.  
     Wineberry Asia.  
*Sorbaria sorbifolia* (L.) A. Br.  
     False Spirea Asia.  
*Sorbus aucuparia* L.  
     Rowan Eura.  
*Spiraea japonica* L. f.  
     Japanese Spiraea Jap.  
**RUTACEAE**  
*Phellodendron amurense* Rupr.  
     Amur Cork Tree Asia.  
**SALICACEAE**  
*Populus alba* L.  
     White, Silverleaf Poplar Eur.  
*P. canescens* (Ait) Sm.  
     Gray Poplar Eur.  
*P. gileadensis* Rouleau  
     Balm of Gilead Eur.  
*P. nigra* L.  
     Black, Lombardy Poplar Eura.  
*Salix alba* L.

White Willow Eur.  
*S. babylonica* L.  
     Weeping Willow Eura.  
*S. caprea* L.  
     Goat Willow Eur.  
*S. cinerea* L.  
     Gray Willow Eur.  
*S. fragilis* L.  
     Crack Willow Eur.  
*S. pentandra* L.  
     Bay-leaved Willow Eur.  
*S. purpurea* L.  
     Purple, Basket Willow Eur.  
**SAPINDACEAE**  
*Koelreuteria paniculata* Laxm.  
     Goldenrain Tree Asia.  
**SAXIFRAGACEAE**  
*Deutzia gracilis* Sieb. & Zucc.  
     Fragrant Deutzia Asia.  
*D. scabra* Thunb.  
     Rough-Leaved Deutzia Asia  
*Philadelphus coronarius* L.  
     Garden Mock-Orange Eur.  
*P. hirsutus* Nutt.  
     Hairy Mock-Orange US.  
*P. inodorus* L.  
     Common Mock-Orange US.  
*P. pubescens* Loisel.  
     Gray Mock-Orange US.  
*Ribes grossularia* L.  
     Garden Gooseberry Eur.  
*R. nigrum* L.  
     Black Currant Eura.  
*R. sativum* Syme.  
     Red Garden Currant Eura.  
**SCROPHULARIACEAE**  
*Paulownia tomentosa* (Thunb.) Steud.  
     Empress, Imperial Tree Chi/Jap.  
**SIMAROUBACEAE**  
*Ailanthus altissima* (Mill.) Swingle  
     Tree of Heaven/Copal Tree Jap.  
**SOLANACEAE**  
*Lycium halimifolium* Mill.  
     Common Matrimony Vine Eur.  
*Solanum dulcamara* L.  
     Bittersweet, Deadly Nightshade Eur.  
**TAMARICACEAE**  
*Tamarix gallica* L.  
     French Tamarisk Eur.  
*T. pentandra* Pall.  
     Salt Cedar Eur.  
**TAXACEAE**  
*Taxus baccata* L.  
     English Yew Eur.

*T. cuspidata* Sieb. & Zucc.  
 Japanese Yew Jap.

**TILIACEAE**

*Tilia cordata* Mill.  
 Small-Leaved European Linden Eur.

*T. x euchlora* K. Koch  
 Crimean Linden N/A

*T. europaea* L.  
 European Linden Eur.

*T. petiolaris* DC.  
 Pendent Silver Linden Eura.

*T. platyphyllos* Scop.  
 Large-leaved Linden Eur.

*T. tomentosa* Moench  
 Silver Linden Eura.

**ULMACEAE**

*Ulmus glabra* Huds.

Smooth Elm Eur.

*U. x hollandica* Mill.  
 Holland Elm Eur.

*U. parviflora* Jacq.  
 Chinese Elm Asia.

*U. procera* Salisb.  
 English Elm Eur.

*U. pumila* L.  
 Siberian, Dwarf Chinese Elm Asia.

*Zelkova serrata* (Thunb.) Makino  
 Japanese Zelkova Jap.

**VERBENACEAE**

*Vitex agnus-castus* L.  
 Chaste Tree/Monk Peppertree Eur.

**VITACEAE**

*Ampelopsis brevipedunculata*  
 (Maxim.) Trautv.  
 Porcelain Berry Asia

### Introduced Herbaceous Plants

**AMARANTHACEAE**

*Amaranthus caudatus* L.  
 Tailed Amaranth TAm.

*A. cruentus* L.  
 Purple Amaranthus Asia.

*A. hybridus* L.  
 Pigweed US.

*A. powellii* S. Wats.  
 Powell Amaranth US/Mex.

*A. retroflexus* L.  
 Green Amaranth US.

*A. spinosus* L.  
 Thorny Amaranth TAm.

*Celosia argentea* L.  
 Cockscomb TAm.

**APIACEAE**

*Aegopodium podagraria* L.  
 Goutweed Eur.

*Anethum graveolens* L.  
 Dill Eur.

*Anthriscus cerefolium* (L.) Hoffm.  
 Chervil Eur.

*A. sylvestris* (L.) Hoffm.  
 Chervil Eur.

*Bupleurum rotundifolium* L.  
 Thoroughwax Eur.

*Carum carvi* L.  
 Caraway Eur.

*Conium maculatum* L.  
 Poison Hemlock Eur.

*Coriandrum sativum* L.  
 Coriander Eura.

*Daucus carota* L.  
 Wild Carrot Eur.

*Falcaria soides* (Wibel) Aschers.  
 Sickle-weed Eur.

*Foeniculum vulgare* Mill.  
 Fennel Eur.

*Hydrocotyle sibthorpiodes* Lam.  
 Lawn-Water-Pennywort Asia/NW.

*Oenanthe aquatica* (L.) Lam.  
 Water Fennel Eur.

*Pastinaca sativa* L.  
 Wild Parsnip Eur.

*Petroselinum crispum* (Mill.) Mansf.  
 Common Parsley Med.

*Pimpinella saxifraga* L.  
 Burnet Saxifrage Eur.

*Seseli libanotis* (L.) Koch  
 N/A. Eur.

*Torilis japonica* (Houtt.) DC.  
 Hedge Parsley Eura.

**APOCYNACEAE**

*Amsonia tabaernaemontana* Walt.  
 Amsonia US.

*Vinca major* L.  
 Large Periwinkle Eur.

*V. minor* L.



Common Periwinkle Eur.  
 ARACEAE  
*Pinellia ternata* (Thunb.) Breit  
 N/A. Jap.  
 ARALIACEAE  
*Hedera helix* L.  
 English Ivy Eur.  
 ASCLEPIADACEAE  
*Asclepias linearis* Scheele  
 Bedstraw Milkweed US.  
 ASTERACEAE  
*Achillea ptarmica* L.  
 Sneezeweed Eur.  
*Arctium lappa* L.  
 Great Burdock Eur.  
*A. minus* (Hill) Bernh.  
 Common Burdock Eur.  
*A. nemorosum* Lej. & Court.  
 Woodland Burdock Eur.  
*A. tomentosum* Mill.  
 Burdock Eur.  
*Artemisia abrotanum* L.  
 Southernwood Eur.  
*A. absinthium* L.  
 Wormwood Eur.  
*A. annua* L.  
 Annual Wormwood Eura.  
*A. biennis* Willd.  
 Biennial Wormwood US.  
*A. ludoviciana* Nutt.  
 Western Mugwort US.  
*A. pontica* L.  
 Roman Wormwood Eur.  
*A. stelleriana* Bess.  
 Old Woman Eur.  
*A. vulgaris* L.  
 Common Mugwort Eur.  
*Aster tartaricus* L. F. (Tartarian)  
 Tartarian Aster Asia.  
*Athemis arvensis* L.  
 Corn Chamomile Eur.  
*A. cotula* L.  
 Stinking Chamomile Eur.  
*A. tinctoria* L.  
 Yellow Chamomile Eur.  
*Bellis perennis* L.  
 English Daisy Eur.  
*Bidens aristosa* (Michx.) Britt  
 Tickseed Sunflower US.  
*B. polylepis* Blake  
 N/A US.  
*Carduus acanthoides* L.  
 Thistle Eur.  
*C. crispus* L.

Curled Thistle Eur.  
*C. nutans* L.  
 Musk, Nodding Thistle Eura.  
*Centaurea calcitrapa* L.  
 Star-Thistle Med.  
*C. cineraria* L.  
 Dusty Miller Eur.  
*C. cyanus* L.  
 Bachelor's Button Eur.  
*C. jacea* L.  
 Brown Knapweed Eur.  
*C. maculata* Lam.  
 Spotted Knapweed Eur.  
*C. nigra* L.  
 Spanish Buttons Eur.  
*C. nigrescens* Willd.  
 N/A Eur.  
*C. scabiosa* L.  
 Scabious Knapweed Eur.  
*C. solstitialis* L.  
 Yellow Star-Thistle Med.  
*C. vochinensis* Bernh.  
 Short-fringed Knapweed Eur.  
*Chondrilla juncea* L.  
 Skeleton Weed Eur.  
*Chrysanthemum balsimita* L.  
 Mint-geranium Eur.  
*C. leucanthemum* L.  
 Ox-eye Daisy Eura.  
*C. parthenium* (L.) Bernh.  
 Feverfew Eur.  
*Cichorium intybus* L.  
 Chicory Eur.  
*Cirsium vulgare* (Savi) Tenore  
 Bull Thistle Eur.  
*Cnicus benedictus* L.  
 Blessed Thistle Eur.  
*Coreopsis tinctoria* Nutt.  
 Tickseed US.  
*Cosmos bipinnatus* Cav.  
 Cosmos Mex.  
*Crepis biennis* L.  
 Hawk's Beard Eur.  
*C. capillaris* (L.) Wallr.  
 Smooth Hawk's Beard Eur.  
*C. japonica* (L.) Benth.  
 Hawk's Beard Asia.  
*C. pulchra* L.  
 Small-Flowered Hawk's Beard Eur.  
*C. tectorum* L.  
 Narrow-Leaved Hawk's Beard Eura.  
*Echinops sphaerocephalus* L.  
 Globe Thistle Eur.  
*Eclipta prostrata* (L.) L.

*(E. alba [L.] Hassk)*  
 Yerba-de-Tajo NW.  
*Eupatorium serotinum* Michx.  
 Joe-Pye-Weed US.  
*Galinsoga caracasana* (DC.) Sch.Bip.  
 Race weed TAm.  
*G. ciliata* (Raf.) Blake  
 Race-weed TAm.  
*G. parviflora* Cav.  
 Smooth Galinsoga TAm.  
*Grindelia squarrosa* (Pursh) Dunal  
 Curlycup-Gumweed US.  
*Helianthus maximiliani* Schrad.  
 Maximilian Sunflower US.  
*Hieracium aurantiacum* L.  
 Orange Hawkweed/Devil's Paint-Brush  
 Eur.  
*H. flagellare* Willd.  
 N/A Eur.  
*H. floribundum* Wimm. & Grab.  
 Smooth Hawkweed Eur.  
*H. pilosella* L.  
 Mouse-Ear Hawkweed Eur.  
*H. pratense* Tausch.  
 Field Hawkweed Eur.  
*H. sabaudum* L.  
 Hawkweed Eur.  
*Hypochoeris radicata* L.  
 Cat's-Ear Eur.  
*Inula helenium* L.  
 Elecampane Eur.  
*Lactuca saligna* L.  
 Willow-Leaved Lettuce Eur.  
*L. scariola* L.  
 Prickly Lettuce/Compass Plant Eur.  
*Madia capitata* Nutt.  
 Chilean Tarweed US.  
*Matricaria chamomilla* L.  
 Wild Chamomile Eur.  
*M. maritima* L.  
 Scentless Chamomile Eur.  
*M. matricarioides* (Less.) Porter  
 Pineapple-Weed US.  
*Onopordum acanthium* L.  
 Scotch Thistle Eur.  
*Petasites hybridus* (L.) Gaertn., Mey. Scherb.  
 Butterbur Eur.  
*Picris echioides* L.  
 Ox Tongue Eur.  
*P. hieracoides* L.  
 Bitterweed Eur.  
*Prionopsis ciliata* (Nutt.) Nutt.  
*(Haplopappus ciliatus [Nutt.]DC.)*  
 N/A. US.

*Pulicaria dysenterica* (L.) Gaertn.  
 Fleabane Eur.  
*Senecio viscosus* L.  
 Groundsel Eur.  
*S. vulgaris* L.  
 Common Groundsel Eur.  
*Silphium asteriscus* L.  
 Rosinweed US.  
*S. perfoliatum* L.  
 Cup Plant US.  
*Silybum marianum* (L.) Gaertn  
 Holy Thistle Med.  
*Sonchus arvensis* L.  
 Field Sow-Thistle Eur.  
*S. asper* (L.) Hill  
 Spring-leaved Sow-Thistle Eur.  
*S. oleracea* L.  
 Common Sow-Thistle Eur.  
*S. uliginosis* Bieb.  
 Sow-Thistle Eur.  
*Taraxacum erythrospermum* Andrz.  
 Red-Seeded Dandelion Eur.  
*T. officinale* Weber.  
 Common Dandelion Eur.  
*Tanacetum vulgare* L.  
 Common Tansy Eur.  
*Tragopogon major* Jacq.  
 Goat's Beard Eur.  
*T. porrifolius* L.  
 Oyster Plant Eur.  
*T. pratensis* L.  
 Yellow Goat's Beard Eur.  
*Tussilago farfara* L.  
 Coltsfoot Eur.  
*Xanthium spinosum* L.  
 Spiny Cocklebur Eur.  
 BORAGINACEAE  
*Cynoglossum officinale* L.  
 Hound's Tongue Eur.  
*Echium vulgare* L.  
 Blue Devil/Viper's Bugloss Eur.  
*Lappula echinata* Gilib.  
 Beggar's Lice Eur.  
*Myosotis arvensis* (L.) Hill  
 Forget-Me-Not Eur.  
*M. scorpioides* L.  
 True Forget-Me-Not Eur.  
*M. sylvatica* Hoffm.  
 Garden Forget-Me-Not Eur.  
*M. stricta* Link.  
 Blue Scorpion-Grass Eur.  
*Symphytum aspernum* Lepechin.  
 Rough Comfrey Eur.  
*S. officinale* L.

Common Comfrey Eur.  
**BRASSICACEAE**  
*Alliaria petiolata* (Bieb.) Cavara & Grande  
Garlic Mustard Eur.  
*Alyssum alyssoides* L.  
Alyssum Eur.  
*Armoracia rusticana* (Lam.) Gaertn.  
N/A Eur.  
*Barbarea verna* (Mill.) Aschers.  
Early Winter-Cress Eur.  
*B. vulgaris* R. Br.  
Common Winter-Cress NW.  
*Bertoroa incana* (L.) DC.  
Hoary Alyssum Eur.  
*Brassica juncea* (L.) Coss.  
Indian Mustard Eura.  
*B. napus* L.  
Turnip Eur.  
*Cakile maritima* Scop.  
Sea Rocket Eur.  
*Camelina microcarpa* Andr.  
False Flax Eur.  
*C. sativa* (L.) Crantz  
False Flax Eur.  
*Capsella bursa-pastoris* (L.) Medic.  
Pick-Pocket Eur.  
*Cardaria draba* (L.) Desv.  
Hoary Cress Eur.  
*Conringia orientalis* (L.) Dumort.  
Hare's Ear Mustard Eur.  
*Coronopus didymus* (L.) Sm.  
Wart Cress Eur.  
*Descurainia sophia* (L.) Webb  
Herb-Sophia Eur.  
*Diplotaxis muralis* (L.) DC.  
N/A Eur.  
*D. tenuifolia* (L.) DC.  
Wall Rocket Eur.  
*D. verna* L.  
Whitlow-Grass Eur.  
*Eruca sativa* Mill.  
Rocket Salad Eur.  
*Erucastrum gallicum* (Willd.) O.E. Schultz  
Garden Rocket Eur.  
*Erysimum cheiranthoides* L.  
Wormseed-Mustard Eur.  
*E. repandum* L.  
Treacle-Mustard Eur.  
*Hesperis matronalis* L.  
Dame's Violet Eur.  
*Lepidium campestre* (L.) R. Br.  
Cow-Cress Eur.  
*L. densiflorum* Schrad.  
N/A US.

*L. perfoliatum* L.  
Pepperwort Eur.  
*L. ruderales* L.  
Stinking Pepperweed Eur.  
*Lobularia maritima* (L.) Desv.  
Sweet Alyssum Eur.  
*Lunaria annua* L.  
Moneywort Eur.  
*Raphanus raphanistrum* L.  
Wild Radish Eura.  
*R. sativus* L.  
Garden Radish Eur.  
*Rorippa prostrata* (Bergeret) Schinz & Thell.  
Yellow Cress Eur.  
*R. sylvestris* (L.) Bess.  
Creeping Yellow Cress Eur.  
*Sisymbrium altissimum* L.  
Tumble-Mustard Eur.  
*S. officinale* (L.) Scop.  
Hedge-Mustard Eur.  
*S. loeselii* L.  
Tall Hedge-Mustard Eura.  
*Teesdalia nudicaulis* (L.) R.Br.  
Shepherd Cress Eur.  
*Thlaspi arvense* L.  
Field Penny-Wort Eur.  
*T. perfoliatum* L.  
Penny-Cress Eur.  
**CALLITRICHACEAE**  
*Callitriche stagnalis* Scop.  
Water-starwort Eur.  
**CAMPANULACEAE**  
*Campanula rapunculoides* L.  
European Bellflower Eur.  
**CANNABACEAE**  
*Cannabis sativa* L.  
Marijuana Asia.  
*Humulus japonicus* Sieb. & Zucc.  
Japanese Hop Jap.  
**CAPPARIDACEAE**  
*Polanisia trachysperma* T. & G.  
Clammyweed US.  
**CARYOPHYLLACEAE**  
*Agrostemma githago* L.  
Purple Cockle Eur.  
*Arenaria serpyllifolia* L.  
Thyme-Leaved Sandwort Eur.  
*Cerastium vulgatum* L.  
Common Mouse-Ear Chickweed Eura.  
*Dianthus armeria* L.  
Deptford Pink Eur.  
*D. barbatus* L.  
Sweet William Eur.  
*D. deltoides* L.



Maiden-Pink Eur.  
*D. prolifer* L.  
 Proliferous Pink Eur.  
*Lychnis coronaria* (L.) Desr.  
 Mullein Pink Eur.  
*Myosoton aquaticum* (L.) Moench  
 Giant Chickweed Eur.  
*Saponaria officinalis* L.  
 Bouncing-Bet Eur.  
*S. vaccaria* L.  
 Cow-Herd Eur.  
*Scleranthus annuus* L.  
 Knawel Eur.  
*Silene armeria* L.  
 Sweet William Catchfly Eur.  
*S. conica* L.  
 Striate Catchfly Eur.  
*S. conoidea* L.  
 N/A. Eura.  
*S. cseri* Baumbg.  
 Champion Eur.  
*S. cucubalus* Wibel  
 Bladder Champion Eur.  
*S. dichotoma* Ehrh.  
 Forked Catchfly Eur.  
*S. noctiflora* L.  
 Night Flowering Catchfly Eur.  
*Spergula arvensis* L.  
 Corn-Spurrey Eur.  
*Stellaria alsine* Grimm  
 N/A Eur.  
*S. graminea* L.  
 Common Stitchwort Eur.  
*S. media* (L.) Cyrillo  
 Common Chickweed Eur.  
**CHENOPODIACEAE**  
*Bassia hirsuta* (L.) Aschers  
 Bassia Eur.  
*Chenopodium album* L.  
 Pigweed/Lamb's Quarters Eur.  
*C. ambrosioides* L.  
 Mexican Tea TAm.  
*C. bonus-henricus* L.  
 Good King Henry Eur.  
*C. botrys* L.  
 Jerusalem Oak Eur.  
*C. bushianum* Aellen.  
 Village Goosefoot Eur.  
*C. glaucum* L.  
 Oak-Leaved Goosefoot Eur.  
*C. murale* L.  
 Pigweed Eur.  
*C. polyspermum* L.  
 Many-Seeded Goosefoot Eur.

*C. urbicum* L.  
 City Goosefoot Eur.  
*C. vulvaria* L.  
 Stinking Goosefoot Eur.  
*Kochia scoparia* (L.) Roth  
 Summer-Cyperus Eura.  
*Suadea maritima* (L.) Dumort  
 Low Sea-Blite Eura.  
**CONVOLVULACEAE**  
*Convolvulus arvensis* L.  
 Field Bindweed Eura.  
*Ipomoea hederacea* (L.) Jacq.  
 Ivy-Leaved Morning Glory TAm.  
*I. pandurata* (L.) G. F. W. Mey.  
 Wild Potato Vine US.  
*I. purpurea* (L.) Roth  
 Common Morning Glory TAm.  
**CRASSULACEAE**  
*Sedum alboroseum* Baker  
 Garden Orpine Asia.  
*S. acre* L.  
 Mossy Stonecrop Eur.  
*S. purpureum* (L.) Link  
 Live-Forever Eur.  
*S. sarmentosum* Bunge  
 N/A Asia.  
*S. telephium* L.  
 Live-Forever Eura.  
**CYPERACEAE**  
*Carex caryophyllea* Lat.  
 N/A. Eur.  
*C. divisa* Huds.  
 N/A. Eur.  
*C. divulsa* Stokes  
 N/A. Eur.  
*C. extensa* Good  
 N/A. Eur.  
*C. hirta* L.  
 N/A. Eur.  
*C. kobomugi* Ohwi  
 N/A. Asia.  
*C. muricata* R.W. Schultz  
 (*C. pairali* R.W. Schultz)  
 N/A. Eur.  
*C. spicata* Huds.  
 N/A Eura.  
*Cyperus difformis* L.  
 N/A Asia.  
*C. fuscus* L.  
 Dusky Cyperus Eur.  
*C. iria* L.  
 Yellow Cyperus Eura.  
*C. microiria* Steud.  
 N/A Asia.

- Scirpus pallidus* (Britt.) Fern.  
Bulrush US.
- DIOSCOREACEAE**  
*Dioscorea batatas* Dene.  
PotatoVine/ChineseYam Chi.
- DIPSACACEAE**  
*Dipsacus laciniatus* L.  
Teasel Eur.  
*D. sylvestris* Huds.  
Wild Teasel Eur.  
*Knautia arvensis* (L.) Duby  
Bluebuttons Eur.
- EUPHORBIACEAE**  
*Croton glandulosus* L.  
Croton US.  
*Euphorbia cyparissias* L.  
Cyprus Spurge Eur.  
*E. esula* L.  
Leafy Spurge Eur.  
*E. falcata* L.  
Spurge Eur.  
*E. humistrata* Engelm.  
Spreading Spurge US.  
*E. lathyris* L.  
Caper Spurge/Mole Plant Eur.  
*E. marginata* Prush.  
Snow-on-the-Mountain US.  
*E. peplus* L.  
Petty Spurge Eur.  
*Mercurialis annua* L.  
Boys and Girls/Herb Mercury Eur.  
*Ricinus communis* L.  
Castor Oil Plant TAm.
- FABACEAE**  
*Coronilla varia* L.  
Crown Vetch Eur.  
*Glycine Max* (L.) Merr.  
Soybean Asia.  
*Lathyrus latifolius* L.  
Perennial Pea Eur.  
*L. tuberosus* L.  
Tuberous Vetchling Eur.  
*Lespedeza bicolor* Turcz.  
Japanese Bush Clover Jap.  
*L. cuneata* (Dumont) G. Don  
N/A Asia.  
*L. stipulacea* Maxim.  
Korean Lespedeza Asia.  
*L. striata* (Thunb.) H. & A.  
Japanese Clover Asia.  
*L. corniculatus* L.  
Birdsfoot-Trefoil Eur.  
*Medicago lupulina* L.  
Black Medick Eur.
- M. sativa* L.  
Alfalfa Eur.  
*Melilotus alba* Desr.  
White Sweet Clover Eur.  
*M. officinalis* (L.) Lam.  
Yellow Sweet Clover Eur.  
*Pueraria lobata* (Willd.) Ohwi  
Kudzu-Vine Asia.  
*Trifolium agrarium* L.  
Yellow Hop-Clover Eur.  
*T. arvense* L.  
Old-Field Clover Eur.  
*T. campestre* Schreber.  
Low Hop-Clover Eur.  
*T. dubium* Sibth.  
Low Hop Clover Eur.  
*T. hybridum* L.  
Alsike Clover Eur.  
*T. incarnatum* L.  
Crimson Clover Eur.  
*T. medium* L.  
Zigzag Clover/Cowclover Eur.  
*T. pratense* L.  
Red Clover Eur.  
*T. repens* L.  
White Clover US.  
*T. resupinatum* L.  
Reversed Clover Eur.  
*Vicia angustifolia* Reich.  
Common Vetch Eur.  
*V. cracca* L.  
Tufted Vetch Eur.  
*V. dasycarpa* Tenore  
Wooly Pad Vetch Eur.  
*V. grandiflora* Scop.  
Large-Flowered Vetch Eur.  
*V. narbonneensis* L.  
Narbonne Vetch Eur.  
*V. sativa* L.  
Spring Vetch Eur.  
*V. tetrasperma* (L.) Moench.  
Four Seeded Vetch Eur.  
*V. villosa* Roth  
Winter Vetch Eur.
- FUMARIACEAE**  
*Fumaria officinalis* L.  
Fumitory Eur.
- GENTIANACEAE**  
*Centaurium pulchellum* (Sw.) Druce  
N/A Eur.  
*Nymphoides peltata* (Gmel.) Ktze.  
Yellow-Floating Heart Eur.
- GERANIACEAE**  
*Geranium columbinum* L.

Dove's Foot/Long Stalked Cranesbill Eur.  
*G. dissectum* L.  
 Cut-Leaved Cranesbill Eur.  
*G. molle* L.  
 Cranesbill Eur.  
*G. nepalense* Sweet  
 N/A Asia.  
*G. pusillum* L.  
 Small-Flowered Cranesbill Eur.  
*G. sibiricum* L.  
 Siberian Cranes Eura.  
**HALORAGACEAE**  
*Myriophyllum brasiliense* Camb.  
 Parrot Feather SAM.  
*M. spicatum* L.  
 Eurasian Watermilfoil Eura.  
**HYDROCHARITACEAE**  
*Elodea densa* (Planch.) Caspary  
 Waterweed Arg.  
*Hydrilla verticillata* (L. f.) Royle  
 Waterthyme N/A.  
**IRIDACEAE**  
*Belamcanda chinensis* (L.) DC.  
 Blackberry Lily Asia.  
*Iris germanica* L.  
 German Iris Eur.  
*I. pseudacorus* L.  
 Yellow Iris Eur.  
**LAMIACEAE**  
*Agastache foeniculum* (Pursh) Ktze.  
 Blue Giant Hyssop US.  
*Ajuga reptans* L.  
 Bugleweed Eur.  
*Ballota nigra* L.  
 Black Horehound Eur.  
*Glechoma hederacea* L.  
 Gill-Over-The-Ground Eur.  
*Lamium amplexicaule* L.  
 Henbit Eura.  
*L. maculatum* L.  
 N/A Eur.  
*L. purpureum* L.  
 Purple Dead-Nettle Eur.  
*Leonurus marrubiastrum* L.  
 Horehound Motherwort Eur.  
*Lycopus europaeus* L.  
 Gypsy Weed/Marsh Horehound Eur.  
*Marrubium vulgare* L.  
 Common Horehound Eur.  
*Melissa officinalis* L.  
 Common Balm Eur.  
*Mentha aquatica* L.  
 Water Mint Eura.  
*M. cardiaca* Baker

Small-Leaved Mint Eur.  
*M. longifolia* (L.) Huds.  
 Horse Mint Eur.  
*M. gentilis* L.  
 Creeping Mint Circ.  
*M. piperita* L.  
 Peppermint Eur.  
*M. pulegium* L.  
 Mint Eur.  
*M. spicata* L.  
 Spearmint Eur.  
*Perilla frutescens* (L.) Britt.  
 N/A Asia.  
*Prunella vulgaris* L.  
 Heal-All Eura.  
*Salvia verbenacea* L.  
 Wild Sage Eur.  
*S. verticillata* L.  
 Sage Eur.  
*Satureja acinos* (L.) Scheele  
 Mother-of-Thyme Eur.  
*S. calamintha* (L.) Scheele  
 Basil-Thyme Eur.  
*Stachys palustris* L.  
 Woundwort Eur.  
**LILIACEAE**  
*Allium oleraceum* L.  
 Wild Garlic Eur.  
*A. sativum* L.  
 Garlic W.Asia.  
*A. vineale* L.  
 Wild or Field Garlic Eur.  
*Asparagus officinalis* L.  
 Garden Asparagus Eur.  
*Convallaria majalis* L.  
 Lily-of-the-Valley Eur.  
*Hemercallis flava* L.  
 Yellow Daylily Asia.  
*H. fulva* L.  
 Common Orange Daylily Eura.  
*Hosta lancifolia* (Thunb.) Engl.  
 Narrow-Leaved Plantain Lily Asia.  
*H. ventricosa* (Salisb.) Stearn  
 Blue Plantain Lily Asia.  
*Lilium tigrinum* Ker.  
 Tiger Lily Asia.  
*Muscari botryoides* (L.) Mill.  
 Grape Hyacinth Eur.  
*Narcissus spp.* L.  
 Daffodil Eur.  
*Ornithogalum nutans* L.  
 Star of Bethlehem Eur.  
*O. umbellatum* L.  
 Nodding Star of Bethlehem Eur.



- Tulipa sylvestris* L.  
Tulip Eur.
- LYTHRACEAE  
*Lythrum salicaria* L.  
Purple Loosestrife Eur.
- MALVACEAE  
*Abutilon theophrasti* Medic.  
Velvet Leaf/Indian Mallow Ind.  
*Althaea officinalis* L.  
Marshmallow Eur.  
*A. rosea* Cav.  
Hollyhock Eura.  
*Hibiscus syriacus* L.  
Rose-Of-Sharon Asia.  
*H. trionum* L.  
Flower-Of-An-Hour Eur.  
*Malva moschata* L.  
Musk Mallow Eur.  
*M. neglecta* Wallr.  
Cheeses Eur.  
*M. sylvestris* L.  
High Mallow Eur.  
*M. verticillata* L.  
Whorled Mallow Eur.  
*Sida spinosa* L.  
Prickly Mallow TAm.
- MIMOSACEAE  
*Desmanthus illinoensis* (Michx.) MacMill  
Prairie-Mimosa US.
- NYCTAGINACEAE  
*Mirabilis jalapa* L.  
Four-O'-Clock TAm.  
*M. nyctaginea* (Michx.) MacM.  
Heart Leaf US.
- ONAGRACEAE  
*Epilobium hirsutum* L.  
Great Hairy Willow-Herb Eur.
- OROBANCHACEAE  
*Orobanche minor* J.E. Smith  
Lesser Broom Rape Eur.
- PAPAVERACEAE  
*Argemone alba* Lestib. f.  
White Thorn-poppy US.  
*A. mexicana* L.  
Mexican Thorn-poppy TAm.  
*Chelidonium majus* L.  
Herbe Aux Verrues Eur.  
*Eschscholtzia californica* Cham.  
California Poppy US.  
*Macleaya cordata* (Willd.) R. Br.  
Plume Poppy Chi/Jap.  
*Papaver dubium* L.  
Poppy Eur.  
*P. rhoeas* L.
- Corn-Poppy Eur.
- PLANTAGINACEAE  
*Plantago aristata* L.  
Bracted Plantain US.  
*P. lanceolata* L.  
English Plantain/Ribgrass Eur.  
*P. major* L.  
Broad-Leaved Plantain Eur.
- POACEAE  
*Aegilops cylindrica* Host  
Goat Grass Eur.  
*Aira caryophylla* L.  
Silver Hairgrass Eur.  
*A. elgans* Willd. ex Kunth  
N/A. Eur.  
*A. praecox* L.  
Hairgrass Eur.  
*Alopecurus geniculatus* L.  
Marsh or Floating Foxtail US.  
*A. myosuroides* Huds.  
Slender Foxtail Eur.  
*A. pratensis* L.  
Meadow-Foxtail Eur.  
*Anthoxanthum odoratum* L.  
Sweet Vernal Grass Eur.  
*Arrhenatherum elatius* (L.) Mert. & Koch  
Tall Oat Grass Eur.  
*Arundo donax* L.  
Giant Reed Eur.  
*Arthraxon hispidus* (Thunb.) Makino  
Arthraxon Asia.  
*Avena fatua* L.  
Oat Eur.  
*A. sativa* L.  
Oat Eur.  
*Briza media* L.  
Quaking Grass Eur.  
*B. minor* L.  
Little Quaking Grass Eur.  
*Bromus arvensis* L.  
Field Bromegrass Eur.  
*B. catharticus* Vahl.  
Rescue Grass SAM.  
*B. commutatus* Schrad.  
N/A Eur.  
*B. inermis* Leyss.  
Awnless Bromegrass Eur.  
*B. japonicus* Thunb.  
Japanese Bromegrass Jap.  
*B. mollis* L.  
Soft Chess Eur.  
*B. racemosus* L.  
Smooth Bromegrass Eur.  
*B. rigidus* Roth

Ripgut Grass Eur.  
*B. secalinus* L.  
 Chess/ Cheat Eur.  
*B. sterilis* L.  
 Barren Brome grass Eur.  
*B. tectorum* L.  
 Downy Chess/Downy Brome Eur.  
*Calamagrostis epigejos* (L.) Roth  
 Feathertop Eura.  
*Cenchrus tribuloides* L.  
 Sand-Spur TAM.  
*Cynodon dactylon* (L.) Pers.  
 Bermuda Grass Eur.  
*Cynosurus cristatus* L.  
 Crested Dog's-Tail Eur.  
*C. echinatus* L.  
 Dog's Tail Eur.  
*Dactylis glomerata* L.  
 Orchard-Grass Eur.  
*Echinochloa crus-gallii* (L.) Beauv.  
 Barnyard Grass Eura.  
*Eleusine indica* (L.) Gaertn.  
 Wiregrass Eur.  
*Eragrostis mexicana* (Hornem.) Link  
 Mexican Love Grass US.  
*E. minor* Host  
 N/A Eur.  
*Festuca elatior* L.  
 Meadow Fescue Eur.  
*F. myuros* L.  
 Rat-Tail Fescue Eur.  
*F. obtusa* Biehler  
 N/A US.  
*F. ovina* L.  
 Sheep's-Fescue Eura.  
*F. rubra* L.  
 N/A Eura.  
*Holcus lanatus* L.  
 Velvet Grass Eur.  
*Lolium multiflorum* Lam.  
 Annual or Italian Ryegrass Eur.  
*L. perenne* L.  
 Perennial Ryegrass Eur.  
*L. temulentum* L.  
 Ryegrass Eur.  
*Microstegium vimineum* (Trin.) A. Camus  
 Nepalese Browntop N/A.  
*Miscanthus sinensis* Anderss.  
 Eulalia Asia.  
*Milium effusum* L.  
 Millet-Grass Eura.  
*Panicum miliaceum* L.  
 Millet Eur.  
*Paspalum dilatatum* Poir.

Dallis Grass SAM.  
*Paspalum setaceum* Michx.  
 N/A Mex.  
*Phalaris canariensis* L.  
 Canary/Bird-Seed Grass Eur.  
*Phragmites australis* (Cav.) Trin. ex Steud.  
 Common Reed US.  
*Phleum pratense* L.  
 Common Timothy Eur.  
*Poa annua* L.  
 Annual Bluegrass/Speargrass Eur.  
*P. compressa* L.  
 Canada Bluegrass Eur.  
*P. pratense* L.  
 Kentucky Bluegrass US.  
*P. trivialis* L.  
 Rough-Stalked Meadow-Grass Eur.  
*Puccinellia distans* (L.) Parl.  
 Alkali Grass Eur.  
*Setaria faberii* Herrm.  
 N/A Asia.  
*S. glauca* (L.) Beauv. (Poir.) Schulte  
 Yellow Foxtail Eura.  
*S. italica* (L.) Beauv.  
 Foxtail Eura.  
*S. verticillata* (L.) Beauv.  
 Bur Bristlegrass Eura.  
*S. viridis* (L.) Beauv.  
 Green Foxtail Eura.  
*Triticum aestivum* L.  
 Wheat Eura.

POLYGONACEAE

*Fagopyrum sagittatum* Gilib.  
 Buckwheat Asia.  
*Polygonum aviculare* L.  
 Knotweed Eur.  
*P. caespitosum* Blume  
 N/A Asia.  
*P. convolvulus* L.  
 Black Bindweed Eur.  
*P. cuspidatum* Sieb. & Zucc.  
 Japanese Knotweed Asia.  
*P. hydropiper* L.  
 Common Smart-Weed Eura.  
*P. lapathifolium* L.  
 N/A Eur.  
*P. orientale* L.  
 Prince's Feather Eura.  
*P. persicaria* Stein (*P. dubium* Stein)  
 Lady's Thumb Eur.  
*P. perfoliatum* L.  
 Mile a Minute Asia.  
*P. sachelinense* F. Schmidt  
 Giant Knotweed Russ.

*Rumex acetosa* L.  
     Garden-Sorrel Eur.  
*R. acetosella* L.  
     Sheep-Sorrel Eur.  
*R. crispus* L.  
     Curled/Yellow Dock Eur.  
*R. maritimus* L.  
     Golden Dock Eur.  
*R. obtusifolius* L.  
     Bitter Dock Eur.  
*R. patientia* L.  
     Patience Dock Eura.  
*R. pulcher* L.  
     Fiddle Dock Eur.  
**PORTULACACEAE**  
*Portulaca grandiflora* Hook.  
     Moss-Rose SAM.  
**PRIMULACEAE**  
*Anagallis arvensis* L.  
     Common Pimpernel Eur.  
*Lysimachia nummularia* L.  
     Moneywort Eur.  
*L. punctata* L.  
     Spotted Loosestrife Eur.  
*L. vulgaris* L.  
     Garden Loosestrife Eur.  
**RANUNCULACEAE**  
*Aquilegia vulgaris* L.  
     Garden Columbine Eur.  
*Delphinium ajacis* L.  
     Rocket Larkspur Eur.  
*D. consolida* L.  
     Larkspur Eur.  
*Ranunculus bulbosus* L.  
     Bulbous Buttercup Eur.  
*R. ficaria* L.  
     Lesser Celandine Eur.  
*R. parviflorus* L.  
     Small-Flowered Crowfoot Eur.  
*R. sardous* Crantz  
     Sardous' Buttercup Eur.  
*R. scleratus* L.  
     Cursed Crowfoot Eura.  
**RESEDACEAE**  
*Reseda lutea* L.  
     Mignonette Eur.  
*R. luteola* L.  
     Dyer's Rocket Eur.  
**ROSACEAE**  
*Duchesnea indica* (Andr.) Focke  
     Indian Strawberry Asia.  
*Fragaria vesca* var. *vesca* L.  
     Woodland Strawberry Eur.  
*Geum aleppicum* Jacq.

    Avens Eura.  
*Potentilla argentea* L.  
     Silvery Cinquefoil Eur.  
*P. intermedia* L.  
     Downy Cinquefoil Eur.  
*P. recta* L.  
     N/A Eur.  
*P. reptans* L.  
     Creeping Cinquefoil Eur.  
*Sanguisorba minor* Scop.  
     Garden Burnet Eur.  
**RUBIACEAE**  
*Asperula arvensis* L.  
     Woodruff Eur.  
*A. odorata* L.  
     Sweet Woodruff Eur.  
*Galium mollugo* L.  
     White Bedstraw Eur.  
*G. pedemontanum* All.  
     Bedstraw Eur.  
*G. verum* L.  
     True or Yellow Bedstraw Eur.  
*Richardia scabra* L.  
     Mexican Clover TAM.  
*Sherardia arvensis* L.  
     Field Madder Eur.  
**SCROPHULARIACEAE**  
*Chaenorrhinum minus* (L.) Lange  
     Small Snapdragon Eur.  
*Cymbalaria muralis* Gaertn., Mey. & Schreb.  
     Kenilworth Ivy Eur.  
*Kickxia elatine* (L.) Dumort.  
     Canker-Root Eur.  
*Linaria vulgaris* Hill  
     Butter and Eggs Eur.  
*Verbascum blattaria* L.  
     Moth Mullein Eur.  
*V. phlomoides* L.  
     Clasping-Leaved Mullein Eur.  
*V. thapsus* L.  
     Common or Great Mullein Eur.  
*Veronica agrestis* L.  
     Garden Speedwell Eur.  
*V. anagallis-aquatica* L.  
     Water Speedwell Eur./SAM.  
*V. arvensis* L.  
     Corn Speedwell Eur.  
*V. chamaedrys* L.  
     Germander Speedwell Eur.  
*V. hederacifolia* L.  
     Ivy-Leaved Speedwell Eur.  
*V. latifolia* L.  
     Speedwell Eur.  
*V. longifolia* L.



Speedwell Eur.	<i>S. sarachoides</i> Sendtner
<i>V. persica</i> Poir.	Nightshade SAM.
Bird's Eye Asia.	TYPHACEAE
<i>V. polita</i> Fries	<i>Typha domingensis</i> Pers.
N/A Eur.	Santo Domingo Cat-Tail TAm.
<i>V. serpyllifolia</i> L.	URTICACEAE
Thyme-Leaved Speedwell Eur.	<i>Urtica dioica</i> L.
SOLANACEAE	Stinging Nettle Eur.
<i>Datura meteloides</i> Dunal	<i>U. urens</i> L.
N/A US./TAm.	Burning Nettle Eur.
<i>D. stramonium</i> L.	VALERIANACEAE
Jimson-Weed TAm./Asia.	<i>Valeriana locusta</i> (L.) Bettke
<i>Nicandra physalodes</i> (L.) Pers.	N/A US./Eur.
Apple-of-Peru SAM.	<i>V. officinalis</i> L.
<i>Petunia axillaris</i> (Lam.) BSP	Garden Heliotrope Eur.
Petunia SAM.	VERBENACEAE
<i>P. integrifolia</i> (Hook.) Schinz and Thellung	<i>Verbena officinalis</i> L.
Petunia SAM.	European Vervain Eur.
<i>P. parviflora</i> Juss.	<i>V. stricta</i> Vent.
Seaside Petunia SAM.	Hoary-Verbena US.
<i>Physalis alkekengi</i> L.	VIOLACEAE
Chinese Lantern Asia.	<i>Viola arvensis</i> Murr.
<i>Solanum dulcamara</i> L.	European Wild Pansy Eur.
Bittersweet Eur.	<i>V. tricolor</i> L.
<i>S. nigrum</i> L.	Johnny-Jump-Up Eur.
Black Nightshade Eur.	ZOSTERACEAE
	<i>Potamogeton crispus</i> L.
	Curly Pondweed Eur.

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## The Dragonflies and Damselflies (Insecta: Odonata) of Cranesville Swamp, Garrett County, Maryland and Preston County, West Virginia

Richard Orr

This report summarizes field work completed in 1996 and 1997 for fulfillment of a Maryland Department of Natural Resources (DNR), Heritage and Biodiversity Conservation Program (HBCP) contract. The purpose of the contract was to survey for species of dragonflies and damselflies residing at Cranesville Swamp. Cranesville Swamp is located high (mean elevation 2560 ft) in the Allegheny Plateau Physiographic Province on the border of Garrett County, Maryland and Preston County, West Virginia.

Cranesville Swamp is recognized as a peatland bog formed during the most recent Ice Age. Its unique fauna and flora are maintained because of a frost-pocket microclimate habitat that is characteristic of a more northern bog-habitat than is usually found in Maryland. The biology and history of Cranesville Swamp is reasonably well documented. Good general biological accounts can be found in Mansueti (1958), Adams (1973), and Guthrie (1974). Because of its unique nature, the Nature Conservancy started purchasing Cranesville Swamp in 1960 and by 1998 had secured protection for 1,015 acres (The Nature Conservancy 1998).

Two general locations were surveyed for this study. Both belong to the Nature Conservancy (TNC). The first was the TNC boardwalk (Cranesville Bog Site) located mostly in West Virginia. The aquatic habitats surveyed were bog ponds, beaver ponds, and the small streams flowing into, and through, the bog. Muddy Creek at this site consisted of a series of beaver ponds and provided little free-flowing stream habitat.

The second location was Muddy Creek (Muddy Creek Site) where it crosses Cranesville Road in Maryland (previously the Lewis property). At this location, Muddy Creek is at the edge of the Cranesville Swamp and has taken on the character of a free flowing river, thus providing habitat very different from the aquatic habitats found at the Cranesville Bog Site. Both the creek and side ponds/bogs were sampled. Muddy Creek was surveyed for approximately 2 kilometers west of the Cranesville Road Bridge to a few hundred meters east of the bridge.

Field work consisted of full day visits on June 11, July 16, and August 20, in 1996. This was supplemented with full day visits on May 28, June 14, June 15, July 21, September 17, and October 9, in 1997. Most of the data collected were from adults or cast skins, although limited larval samples were taken. All species of Odonata seen, along with numbers of each species, location, habitat, and behavior (territorial, ovipositional, feeding, etc.) were recorded during each visit and later transferred to data sheets. Selected information was then entered into a spread sheet program for analysis.

In addition to the current survey, Ahrens (1968) conducted a survey of dragonflies and damselflies of Cranesville Swamp during twelve collecting trips in 1966. Ahrens found forty (40) species of Odonata during the 1966 survey; eleven (11) of which were not seen during the 1996-1997 survey. The 1996-1997 study recorded fifty-four (54) species, of which twenty-two (22) species were not recorded by Ahrens. Since the 11 species unique to the 1966 survey were mostly pond species and the majority of the 22 species unique to the 1996-1997 survey were mostly stream species, it is reasonable to assume that the major differences in the two surveys reflected different habitat sampling preferences by the collectors. A total of sixty-five (65) species of Odonata are currently reported from Cranesville Swamp.

The following is a complete list of all known species of dragonflies and damselflies which have been recorded from Cranesville Swamp with a short summary of their aquatic habitat preferences, known flight times, and other pertinent biological information. Included in this list are a number of species which have not previously been recorded in the literature as occurring in Maryland or West Virginia. The common names reflect the standardized common names recommended by the Dragonfly Society of the Americas (DSA 1996).

### DRAGONFLIES (Anisoptera)

#### Gomphidae (Clubtails)

1. *Arigomphus villosipes* (Selys, 1854) -- The **Unicorn Clubtail** was found with reasonable frequency at beaver ponds



from mid June to the end of July. A few were also found along the slower sections of Muddy Creek. The Unicorn Clubtail is widespread in Maryland.

2. *Gomphus exilis* Selys, 1854 -- A single **Lancet Clubtail** was found at Cranesville Swamp along the power line right-of-way at the Cranesville Bog Site on June 14, 1997. This species was not recorded by Ahrens in 1966. This dragonfly is normally associated with ponds and is widespread in Maryland.

3. *Gomphus lividus* Selys, 1854 -- The **Ashy Clubtail** was most often seen in clearings where the males could be identified by their characteristic rolling flight. This species was found from mid June to the end of July with the peak of adult activity during June. Larval habitat was Muddy Creek and its tributaries. This species was not recorded by Ahrens in 1966.

4. *Gomphus rogersi* Gloyd, 1936 -- The **Sable Clubtail** is listed by the DNR as highly rare and endangered in Maryland. A healthy population occurs along the Muddy Creek Site. Emergence occurs in mid June and adults can be found through the end of July. By the end of June the Sable Clubtail is the most abundant gomphid along Muddy Creek. Its known range along Muddy Creek extends from Springs Run to just before Swallow Falls. This population takes on added significance since the only other known site for this species in Maryland (Prince George's County) is extirpated (Orr 1996). This species was not recorded by Ahrens in 1966.

5. *Hagenius brevistylus* Selys, 1854 -- The **Dragonhunter** is a massive dragonfly of streams and rivers, and is widespread in Maryland. This species was not found during the 1996-1997 survey but was recorded by Ahrens on July 8, 1966.

6. *Lanthus vernalis* Carle 1980 -- The **Southern Pygmy Clubtail** is currently known from two locations in Maryland. The Mount Nebo population (Garrett County) was found in 1995, and the Steep Creek population (Blue Ridge Mountains in Frederick County) in 1994. *Lanthus vernalis* was collected from Cranesville Swamp on July 14, 1997 on a small wooded stream entering the bog on the West Virginia side. This small attractive clubtail will likely turn up in other clean water streams in Western Maryland. The larvae of *Lanthus vernalis* inhabit pools and slow moving sections of otherwise fast moving streams and are well distributed (but local) in the mountain streams of Pennsylvania and Virginia (Carle 1983). This species was not recorded by Ahrens.

7. *Stylogomphus albistylus* (Hagen in Selys 1878) The **Least Clubtail** is the smallest gomphid dragonfly in North America and is reasonably widespread in Maryland. A single individual was found along Muddy Creek on August 20, 1996. This species was not recorded by Ahrens.

#### Aeshnidae (Darners)

8. *Aeshna canadensis* Walker 1908 -- The **Canada Darner** is a large attractive dragonfly that had not been reported from Maryland until 1993, but was recorded at Cranesville Swamp in August of 1966 on the West Virginia side (Ahrens 1968). In Maryland, it has been found only in Garrett County. *Aeshna canadensis* was common in 1996 and 1997 at Cranesville Swamp, with the adults flying from the end of July well into October. *Aeshna canadensis* is an abundant northern boreal species which is capable of covering great distances in flight. The Canada Darner most likely extends its population along its southern range under ideal conditions. The presence of cast skins of *Aeshna canadensis* indicates that at least some of the individuals complete their life cycle at Cranesville Swamp. The current population at Cranesville Swamp, based on the number of cast skins and adults, is healthy and stable. The southern most record of this species is Highland County, Virginia (Carle 1983).

9. *Aeshna tuberculifera* Walker 1908 -- The **Black-tipped Darner** is also a powerful flying boreal species which could conceivably show up far from its normal range. *Aeshna tuberculifera* has a very spotty record from Maryland, with two historical records (both in 1916) from Prince George's County, records in Howard County in 1996 and 1997, and recent scattered records from Garrett County including Mount Nebo Wildlife Management Area, Mt. Negro Bog, Finzel Swamp, and Cranesville Swamp. The presence of cast skins of *Aeshna tuberculifera* indicates that at least some of the individuals complete their life cycle at Cranesville Swamp, but it is not as common as *A. canadensis* or *A. umbrosa*. The Black-tipped Darner was found from mid July to mid October at Cranesville Swamp. This dragonfly's southern

limit is western North Carolina (Cuyler 1984). In Virginia, *A. tuberculifera* is encountered more often than *A. canadensis*, just the opposite from what occurs in Garrett County. This species was not recorded by Ahrens in 1966.

10. *Aeshna umbrosa* Walker, 1908 -- The **Shadow Darner** is widespread in Maryland where its larvae are usually associated with slow moving streams or creeks. This species is common at Cranesville Swamp where it can be seen from August well into October with peak activity in September.

11. *Aeshna verticalis* Hagen, 1861 -- Like most of the species in this genus, the **Green-striped Darner** is a northern boreal strong-flying species, capable of covering great distances in flight. The Green-striped Darner has a very spotty record from Maryland, with historical records from Prince George's county, a 1995 and 1997 record from Anne Arundel County (Patuxent Wildlife Research Center), and scattered records from Garrett county. At Cranesville Swamp the only individual seen was a male collected over a beaver pond on September 17, 1997. Since *Aeshna verticalis* likely extends the southern border of its range during ideal years, it is difficult to determine if these individuals are from a permanent resident population, a temporary resident population, or stray adults from the north or west. I was not able to find any larvae or cast skins of this species at Cranesville Swamp, but still consider it likely that at least some individuals complete their life cycle locally. Although predominately a northern species, individuals have been collected as far south as Transylvania County, North Carolina, and it is rarely encountered in Virginia (Carle 1983). This species was not recorded by Ahrens.

12. *Anax junius* (Drury 1770) -- The **Common Green Darner** is a widespread pond species in Maryland. The flight period at Cranesville Swamp is from May through October, with July being the most active. Exuviae were collected from both beaver and natural bog ponds at Cranesville swamp.

13. *Basiaeschna janata* (Say 1939) -- The **Springtime Darner** is a common, early spring, river dragonfly which is found throughout much of Maryland. Three individuals were seen along the free flowing sections of Muddy Creek on June 15, 1998. This species was not recorded by Ahrens.

14. *Boyeria vinosa* (Say 1839) -- The **Fawn Darner** is a stream, fall flying species, that is widespread in Maryland. Flight period along Muddy Creek and its tributaries at Cranesville Swamp was from mid August well into October. This species was not recorded by Ahrens.

15. *Epiaeschna heros* (Fabricius 1798) -- The **Swamp Darner** is the largest dragonfly that occurs in Maryland. It is widespread. The larval habitat is deeply-shaded swamps. Although not common at Cranesville a couple of individuals were seen during mid June of 1997. This species was not recorded by Ahrens.

#### Cordulegastridae (Spiketails)

16. *Cordulegaster diastatops* Selys 1854 -- The **Delta-spotted Spiketail** is currently known in Maryland only from Garrett County. This species likes boggy streams at Cranesville Swamp and was easily found from mid June through July. This species was not recorded by Ahrens.

#### Macromiidae (Cruisers)

17. *Macromia illinoensis illinoensis* Walsh 1862 -- The **Illinois River Cruiser** is a riverine species found throughout Maryland. Two individuals were seen flying over a free flowing section of Muddy Creek on August 20, 1997. This species was not recorded by Ahrens.

#### Corduliidae (Emeralds)

18. *Cordulia shurtleffi* Scudder 1866 -- The **American Emerald** is considered to be one of the most abundant and widespread dragonfly species in Canada. In Maryland it is known only from Garrett County. At Cranesville Swamp it is common over ponds during June and July.

19. *Epitheca canis* McLachlan 1866 -- The **Beaverpond Baskettail** appears to be restricted in Maryland to relatively high elevation beaver ponds and man-made ponds in Garrett County. It is currently recorded from 5 locations in Garrett



County but additional sites will likely be found in western Maryland. It is a common June species at Cranesville Swamp. The Beaverpond Baskettail is a widespread boreal species with the southern most record for eastern North America taken at Highland County, Virginia (Carle 1983).

20. *Epitheca princeps* Hagen 1861 -- The **Prince Baskettail** is a widespread species in Maryland, usually associated with large bodies of water (rivers, canals, lakes). Although not recorded during the 1996-1997 survey, Ahrens recorded this species on August 7 and 8, 1966 at Cranesville Swamp.

21. *Epitheca cynosura* (Say 1839) -- The **Common Baskettail** is a widespread, often abundant spring species throughout Maryland. Although not recorded during the 1996-1997 survey, Ahrens record this species on June 18 and again on July 24, 1966 at Cranesville Swamp.

22. *Somatochlora elongata* (Scudder 1866) -- The **Ski-tailed Emerald** is a large green-eyed dragonfly that is not difficult to find at Cranesville Swamp. It appears to replace the spring flying *Cordulia shurtleffi* as the main corduliid by late summer. Flight period at Cranesville ranges from mid July through August. The only other record of the Ski-tailed Emerald from Maryland is a single historical record from Montgomery County. However, since this species is found at upland ponds in western Virginia (Carle 1983), I suspect that it will also turn up elsewhere in western Maryland. This species was not recorded by Ahrens.

23. *Somatochlora tenebrosa* (Say 1839) -- The **Clamp-tipped Emerald** is a widespread species in Maryland associated with slow moving streams. Ahrens reported seeing adults in August, 1966. The 1996-1997 survey's only *S. tenebrosa* were two larvae collected from Muddy Creek on May 28, 1997.

#### Libellulidae (Skimmers)

24. *Celithemis elisa* (Hagen 1861) -- The **Calico Pennant** was reported by Ahrens from Cranesville Swamp on July 9, 1966. However, this species was not seen during the 1996-1997 survey. This pond species is widely distributed in Maryland.

25. *Erythemis simplicicollis* (Say 1839) -- Although the **Eastern Pondhawk** is one of the most common and widely distributed pond dragonflies in Maryland, the only one seen during the survey was on June 11, 1996 on a powerline-right-of-way at the Cranesville Bog site. This species was not recorded by Ahrens.

26. *Leucorrhinia intacta* (Hagen 1861) -- The **Dot-tailed Whiteface** has been recorded in Maryland only from Garrett County. Flight period at Cranesville Swamp is June and July, when it can be found at open bog and beaver ponds. This species was not recorded by Ahrens in 1966.

27. *Libellula auripennis* Burmeister 1839 -- A single mature male **Golden-winged Skimmer** was seen over a bog pond on the West Virginia side of the Cranesville Swamp on June 11, 1996. The species has a wide distribution in Maryland but is never found in large numbers. This species was not reported by Ahrens.

28. *Libellula cyanea* Fabricius 1775 -- **Spangled Skimmers** were encountered near beaver ponds and on occasion at bog ponds. The flight period at Cranesville Swamp ranged from June to mid August. This dragonfly is widespread in Maryland.

29. *Libellula flavida* Rambur 1842 -- Ahrens recorded the **Yellow-sided Skimmer** at Cranesville Swamp on June 9, 1966. This is a widespread, but uncommon, bog dragonfly in Maryland. It was not seen during the 1996-1997 survey.

30. *Libellula julia* Uhler 1857 -- The **Chalk-fronted Corporal** is a northern dragonfly which occurs in Maryland only in Garrett County. This is an early season species with the population peaking in June, and individuals surviving until the end of July. This species is common and conspicuous at Cranesville Swamp but was not recorded by Ahrens in 1966. This is reasonable evidence that at least some changes in the Odonata species composition have occurred at Cranesville Swamp during the past 30 years.

31. *Libellula luctuosa* Burmeister 1839 -- Only a few **Widow Skimmers** were observed at Cranesville Swamp during



1996 and 1997. All were recorded near beaver ponds along Muddy Creek. Flight period ranged from July through mid August. This species is widely distributed in Maryland.

32. *Libellula lydia* Drury 1770 -- The **Common Whitetail** is one of the most common and widely distributed pond dragonflies in Maryland. It is conspicuous at Cranesville Swamp throughout its flight period from June (when it is very abundant) through August.

33. *Libellula pulchella* Drury 1770 -- The **Twelve-spotted Skimmer** is a conspicuous pond species at Cranesville Swamp with a flight period of June through August, with highest numbers of individuals appearing in July. This dragonfly is widespread in Maryland.

34. *Libellula semifasciata* Burmeister 1839 -- The **Painted Skimmer** prefers boggy areas with abundant emergent vegetation. This species is widely distributed in Maryland. The Painted Skimmer's flight period at Cranesville Swamp is from June through July, but it is never encountered in great numbers.

35. *Pachydiplax longipennis* (Burmeister 1839) -- The **Blue Dasher** is probably the most abundant summer dragonfly in Maryland, where it can be found at nearly any pond or slow moving stream. Blue Dashers can be seen from June through August at Cranesville Swamp.

36. *Pantala hymenaea* (Say 1839) -- The **Spot-winged Glider** is a migratory species. A single individual was seen over an open field on July 16, 1996 and was probably a stray. Although this species most likely completes its larval cycle on the coastal plain in Maryland (Orr 1996) it is unlikely that it could complete larval development in the colder waters of Cranesville Swamp. This species was not recorded by Ahrens.

37. *Perithemis tenera* (Say 1839) -- Although the **Eastern Amberwing** is a common pond species throughout Maryland, it was not observed during the 1996-1997 survey. However, Ahrens did find it at Cranesville Swamp on August 8, 1966.

38. *Sympetrum obtrusum* (Hagen 1867) -- The **White-faced Meadowhawk** is a small stream species which is common in Western Maryland. The adults can be found at Cranesville Swamp from July through September, with the peak activity occurring in August.

39. *Sympetrum semicinctum* (Say 1839) -- The **Band-winged Meadowhawk** also occurs in small streams but is much less common in Western Maryland than *S. obtrusum*. Its flight period at Cranesville Swamp runs from July through September.

40. *Sympetrum vicinum* (Hagen 1861) -- The **Yellow-legged Meadowhawk** is a late-fall pond dragonfly found throughout Maryland. It is the most abundant fall dragonfly at Cranesville bog. The flight period lasts from July well into October.

41. *Tramea lacerata* Hagen 1861 -- The **Black Saddlebags** is migratory. This dragonfly is common in eastern Maryland but much less so in Western Maryland. Dave Czaplak (personal communication) saw a mature male of this species at Cranesville Swamp on June 20, 1993. Neither the 1966 or the 1996-1997 surveys revealed this species.

## DAMSELFLIES (Zygoptera)

### Calopterygidae (Broad-winged Damselfs)

42. *Calopteryx aquabilis* Say 1839 -- The **River Jewelwing** most likely occurs at the Muddy Creek Site. Two larvae were collected on May 28, 1997, which key to *Calopteryx aquabilis* in Westfall and May (1996). Although this species is abundant in the northern United States (Johnson 1974), records south of central Pennsylvania are uncommon. Carle (1988) lists five records for this species in northwestern Virginia, and the United States National Museum has specimens from an unspecified Maryland locality (Nancy Adams personal communication). However, I was unable to find adults of this species at Muddy Creek even though it is easily identified and generally very conspicuous in the adult stage. Because of this, and due to the uncertainties in damselfly larval identification, I am reluctant at this time to list the River

Jewelwing beyond “likely to occur” for the Muddy Creek Site. I am not aware of any other current known location for this species in Maryland. This species was not recorded by Ahrens.

43. *Calopteryx amata* Hagen 1889 -- The **Superb Jewelwing** is a spectacular large, metallic green and bronze damselfly currently known in Maryland from three sites, all located in Garrett County. It is a common resident, although much less so than *C. maculata*, at the Muddy Creek Site where the adults can be seen from early June through August. This species is likely to turn up at other cold, shallow rivers and streams in Garrett County when additional survey work is completed. This species was not recorded by Ahrens in 1966.

44. *Calopteryx maculata* (Beauvois 1805) -- The **Ebony Jewelwing**, with its jet black wings, is a common conspicuous large damselfly of streams throughout Maryland. This species is by far the most common *Calopteryx* at Cranesville Swamp and Muddy Creek where it can be seen during the months of June through August, with the greatest number of individuals in July.

#### Lestidae (Spreadwings)

45. *Archilestes grandis* (Rambur 1842) -- The **Great Spreadwing** is the largest damselfly in Maryland. This species is a widespread fall species in Maryland where it is usually associated with small streams. A single male was collected near a bog pond on October 9, 1997. This species was not recorded by Ahrens.

46. *Lestes congener* Hagen 1861 -- The **Spotted Spreadwing** is a widespread, but uncommon, fall-flying species in Maryland. At Cranesville Swamp it was most often encountered at beaver ponds. Flight period was from mid August into October. The adult population was most abundant during October.

47. *Lestes disjunctus disjunctus* Selys 1862 -- The **Common Spreadwing** consists of two subspecies in Maryland. *Lestes disjunctus australis* is the most abundant pond spreadwing in Eastern Maryland. The subspecies found at Cranesville Swamp, *L. disjunctus disjunctus*, is known in Maryland only from Garrett County. This subspecies is common at Cranesville Swamp where the adults can be found at ponds from mid July to mid September, with peak activity in September. This species is morphologically very close to *Lestes forcipatus*, which was recorded by Ahrens in 1966. Although it is likely that Ahrens' *L. forcipatus* was actually misidentified *L. disjunctus disjunctus*, the possibility that *L. forcipatus* did, or still does, occur at Cranesville Swamp can not be completely ruled out.

48. *Lestes eurinus* Say 1839 -- The **Amber-winged Spreadwing** is uncommon, but widespread, in Maryland where it utilizes ponds for larval development. The only record of this species from Cranesville Swamp is from June 20, 1993, where three adults were seen by Dave Czaplak (personal communication) near the TNC boardwalk.

49. *Lestes rectangularis* Say 1839 -- The **Slender Spreadwing** is a common, widespread, pond damselfly in Maryland. At Cranesville Swamp the adults can be found flying along the edges of beaver and bog ponds from July to mid October, with peak activity in September.

#### Coenagrionidae (Pond Damsels)

50. *Amphiagrion saucium* (Burmeister 1839) -- The **Eastern Red Damsel** has the longest flight period of any Odonata at Cranesville Swamp, ranging from mid May to mid October. However, it was never found to be common. This species is widespread but very local in Maryland, where it normally is associated with grassy bogs or seeps.

51. *Argia fumipennis violacea* (Hagen 1861) -- The **Variable Dancer** is widespread and often common in Maryland, where it utilizes various still and slow moving water for larval development. At Cranesville Swamp it was seen only a few times along Muddy Creek during the months of July and August.

52. *Argia tibialis* (Rambur 1842) -- The **Blue-tipped Dancer** is one of the most abundant stream damselflies in Eastern Maryland. However, at Cranesville Swamp only a few individuals were seen along Muddy Creek during the months of July and August. This species was not recorded by Ahrens in 1966.

53. *Chromagrion conditum* (Hagen in Selys 1876) -- The **Aurora Damsel** is a widespread, spring to early summer



species of ponds in Maryland. At Cranesville Swamp adults were first seen in early June, quickly thereafter reaching high numbers, then tapering off with a few adults lingering on until the end of July. This damselfly seemed to utilize beaver and bog ponds equally.

54. *Enallagma antennatum* (Say 1839) -- The only record of the **Rainbow Bluet** from Cranesville Swamp is from July 24, 1966 (Ahrens 1968). *Enallagma antennatum* is a northern species with its southern limit extending into Garrett and Preston Counties. Roble (1994, 1997) does not list the Rainbow Bluet as occurring in Virginia. It is recorded from Pennsylvania (Westfall and May 1996). Ponds in and near Finzel Swamp (Garrett County) are the only current locations where *Enallagma antennatum* has been observed in Maryland. Based on the biology and mobility of this species, it will likely show up in other similar habitats (large clean ponds) in Garrett County.

55. *Enallagma aspersum* (Hagen 1861) -- Although the **Azure Bluet** is a widespread pond species in Maryland, it was not found during the 1996-1997 survey. Ahrens did record this species during the months of July and August of 1966 at Cranesville Swamp.

56. *Enallagma basidens* Calvert 1902 -- The **Double-striped Bluet** is a pond species which is found throughout Maryland. It was not seen during the 1996-1997 survey but was recorded on August 31, 1966 at Cranesville Swamp by Ahrens.

57. *Enallagma civile* (Hagen 1861) -- Except for the Allegheny Plateau, the **Familiar Bluet** is one of the most common, widespread, pond damselflies in Maryland. On Maryland's Allegheny Plateau it is mostly replaced by *E. hageni*. It was not found during the 1996-1997 survey, but Ahrens did record it from Cranesville Swamp in 1966 from July into October.

58. *Enallagma exsulans* (Hagen 1861) -- The **Stream Bluet** is the most abundant stream *Enallagma* in Maryland. It is a common resident of Muddy Creek during the months of July and August.

59. *Enallagma geminatum* Kellicott 1895 -- In Maryland, the widely distributed **Skimming Bluet** is nearly always associated with floating pond vegetation. It was recorded only once from Cranesville Swamp where it was found on floating vegetation along the edge of Muddy Creek on July 16, 1996.

60. *Enallagma hageni* (Walsh 1863) -- **Hagen's Bluet** is the most abundant damselfly at Cranesville Swamp. It is primarily a pond species but is so common that individuals turned up elsewhere. Except for a single 1922 historical record for Baltimore County, this species has not been reported in Maryland outside of Garrett County. Adults can be found at Cranesville Swamp during the months of June through August.

61. *Enallagma signatum* (Hagen 1861) -- The **Orange Bluet** is a widespread pond species in Maryland. Even if present in large numbers, this species remains inconspicuous because of its faded colors and tendency to seek out shadows. The Orange Bluet was not recorded during the 1996-1997 survey, but Ahrens was able to find it during the months of July and August in 1966.

62. *Ischnura hastata* (Say 1839) -- The **Citrine Forktail** is another widespread damselfly in Maryland. Its preferred habitat is thick grass/sedge/rush emergent vegetation. At Cranesville Swamp it was encountered along the edges of beaver ponds during the months of August and September.

63. *Ischnura posita posita* (Hagen 1861) -- For most of Maryland the tiny **Fragile Forktail** is often the most abundant pond damselfly. Although at Cranesville Swamp it is much less conspicuous than *Enallagma hageni*, both this species and *I. verticalis* exists in high numbers. Flight period at Cranesville Swamp is from early June through mid October.

64. *Ischnura verticalis* (Say 1839) -- The **Eastern Forktail** is common and widespread in ponds throughout Maryland. It is found in good numbers along the edges of ponds at Cranesville Swamp from early June through mid October.

65. *Nehalennia irene* (Hagen 1861) -- The **Sedge Sprite** and the Citrine Forktail are the smallest damselflies at Cranesville Swamp. Like the Citrine Forktail, it prefers habitats with thick grass-like emergent vegetation. It is usually encountered at Cranesville along the edges of ponds from Mid June through August.



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## An Unusual Natural Area in Harford County, Maryland

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During the spring and summer of 1998 I had the opportunity to study an interesting site in northern Harford County, Maryland. The site is located east of Route 165 and south of Route 136 in the Whiteford area approximately 0.7 km south of the Mason-Dixon Line. I first became aware of this site while botanizing during the previous winter. The Harford County Soil Survey (Soil Conservation Service 1975) depicted a large sand and gravel pit dominating the site. Upon visiting the site, it was apparent that the area was previously an operating slate quarry, and numerous slate slabs are still in evidence. The Whiteford area contains several abandoned slate quarries on both sides of Route 136. Hence, local place names such as Slate Ridge School and Slate Ridge Road. A historic marker at the junction of Routes 136 and 165 declares this area the "Peach Bottom Slate Region." The former right-of-way for the Ma and Pa Railroad bisects the property west of the quarry. However, the rails and ties have been removed.

Although the site is totally forested, species dominance varies. The canopy species over much of the quarry are successional species, including black cherry (*Prunus serotina*), walnut (*Juglans nigra*), black locust (*Robinia pseudoacacia*), and red maple (*Acer rubrum*). One area of the quarry is dominated by gray birch (*Betula populifolia*), which has been designated a State of Maryland status unknown (SU) species (Maryland Natural Heritage Program 1994). The status of this short-lived pioneer species in Maryland is currently in dispute. I know of only one other stand in Maryland, also in Harford County, where this species reproduces. Both stands consist of several hundred trees, and both are in old quarry areas where trucks traversed back and forth from Pennsylvania. Since the gray birch is native in Pennsylvania, it may have been transported to these northern Maryland quarry areas in mud contaminated by seed. The shrub layer beneath the birches consists of northern arrowwood (*Viburnum recognitum*). Also present beneath the birches are three or more colonies of pink ladyslipper (*Cypripedium acaule*). While this orchid is not rare in Maryland, it is seldom as abundant as on this site, where there are hundreds of plants, many of which were blooming. Nearby bloomed approximately 50 colic root (*Aletris farinosa*), a rare species on the Maryland Piedmont, but a frequent species on the Eastern Shore. The herb layer in this area is dominated by running pine (*Lycopodium digitatum*), Asiatic tearthumb (*Polygonum perfoliatum*), and stiltgrass (*Microstegium vimineum*). Multiflora rose (*Rosa multiflora*) is abundant along the abandoned RR right-of-way.

Bordering the quarry area are steep, west-facing, black-soiled slopes. Ferns are abundant on these slopes, including hayscented fern (*Dennstaedtia punctilobula*), Christmas fern (*Polystichum acrostichoides*), spinulose woodfern (*Dryopteris carthusiana*), evergreen woodfern (*Dryopteris intermedia*), and triploid woodfern (*Dryopteris* x *triploidea*). This site has the largest colony of any hybrid woodfern, in this case *D.* x *triploidea*, known to me. I estimate this colony to contain between 5,000 to 7,000 *D.* x *triploidea*, a common hybrid between *D. carthusiana* and *D. intermedia*. This sterile hybrid reproduces asexually via giant mothercells, a type of megaspore. It does not produce viable egg cells, but does produce viable sperm cells which are capable of fertilizing the egg cells of either parent, resulting in hybrid backcrosses! There are a significant number of backcrosses among the hybrids on the quarry slopes at this site.

The upland forest bordering Route 165 is dominated by red oak (*Quercus rubra*), pin oak (*Q. palustris*), and white oak (*Q. alba*), with some black oak (*Q. velutina*), white ash (*Fraxinus americanus*), and southern red oak (*Q. falcata*), a species that is rare on the Piedmont. The shrub/vine layer is predominantly northern arrowwood, huckleberry (*Gaylussacia* sp.), spicebush (*Lindera benzoin*), Virginia creeper (*Parthenocissus quinquefolia*), and poison-ivy (*Toxicodendron radicans*). The herb layer is populated by many herbs and abundant colonies of ferns, including New York fern (*Thelypteris noveboracensis*), cinnamon fern (*Osmunda cinnamomea*), interrupted fern (*Osmunda claytoniana*), royal fern (*Osmunda regalis*), sensitive fern (*Onoclea sensibilis*), hayscented fern, northern lady fern (*Athyrium filix-femina* ssp. *angustum*), and Christmas fern. Wild lily-of-the-valley (*Maianthemum canadense*), an infrequent plant in the Piedmont, also occurs here.

A number of wetlands occur in this area. These include seeps, several small streams, a quarry pond, and some swamps, particularly in an area dammed by the old railroad bed. These swamps are dominated by red maple, with northern arrowwood dominating the shrub layer, and skunk cabbage (*Symplocarpus foetidus*) and cinnamon ferns dominating the herb layer. Two unusual ferns occur in these swamps. Log fern (*Dryopteris celsa*), a State of Maryland threatened species, occurs as a small colony of 20 specimens in a swampy seep. Netted chainfern (*Woodwardia*

*areolata*) occurs as several colonies in a swamp between the quarry embankment and the abandoned railroad right of way. This fern is rare on the Piedmont. It is known only from Sugarloaf Mountain in Frederick County on Piedmont soils, and formerly occurred on Coastal Plain soils on the Piedmont at Loch Raven Watershed (Reed 1953). Downy goldenrod (*Solidago patula*), a State of Maryland watchlist (S3) species was also noted on the edge of several wetlands.

Common animals noted at the site include whitetail deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), ground hog (*Marmota monax*), garter snake (*Thamnophis sirtalis*), American toad (*Bufo americanus*), green frog (*Rana clamitans melanota*), and pickerel frog (*Rana palustris*). No rare animal species are known to reside at this site, although on 18 June 1998 a peregrine falcon (*Falco peregrinus*) was observed circling high over the quarry.

Further survey of this area may bring to light other rare species. It is hoped that this site can be preserved. As the area is currently owned by a fishing & hunting association, it is suggested that it not be entered during hunting season, although no signs are currently present at the site.

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